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POSITION OF THE GROUP OF 77 AND CHINA ON BASIC ELEMENTS FOR AN ACTION PROGRAMME FOR THE SUSTAINABLE DEVELOPMENT OF SMALL ISLAND DEVELOPING STATES

CONTENTS

		Paragraphs	Page
PREAMBLE		1 - 15	2
I.	CLIMATE CHANGE AND SEALEVEL RISE	16 - 17	5
II.	NATURAL AND ENVIRONMENTAL DISASTERS	18 - 20	7
III.	MANAGEMENT OF WASTES	21 - 24	8
IV.	COASTAL AND MARINE RESOURCES	25 - 27	11
V.	FRESHWATER RESOURCES	28 - 29	14
VI.	LAND RESOURCES	30 - 33	15
VII.	ENERGY RESOURCES	34 - 37	18
VIII.	TOURISM RESOURCES	38 - 39	19
IX.	BIODIVERSITY RESOURCES	40 - 44	21
X.	NATIONAL INSTITUTIONS AND ADMINISTRATIVE CAPACITY	45 - 48	23
XI.	REGIONAL INSTITUTIONS AND TECHNICAL COOPERATION	49 - 51	25
XII.	TRANSPORT AND COMMUNICATION	52 - 54	27
XIII.	SCIENCE AND TECHNOLOGY	55 - 58	29
XIV.	HUMAN RESOURCE DEVELOPMENT	59 - 62	31
XV.	IMPLEMENTATION, MONITORING AND REVIEW	63 - 90	34

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PREAMBLE

1. Although they are afflicted by economic difficulties and confronted by development imperatives similar to those of developing countries generally, small island developing States also have their own peculiar vulnerabilities and characteristics, so that the difficulties they face in the pursuit of sustainable development are particularly severe and complex.

2. There are many disadvantages which derive from small size. These are magnified by the fact that many island States are not only small but are themselves made up of a number of small islands. Disadvantages include a narrow range of resources, which forces undue specialization; excessive dependence on international trade and hence vulnerability to global developments; high population density, which increases the pressure on already limited resources; overuse of resources and premature depletion; relatively small watersheds, which could easily reach, or be reduced below, the critical minimum; costly public administration and infrastructure, including transportation and communication; and limited institutional capacities and domestic markets, which are too small to provide significant scale economies, while their limited export volumes, sometimes from remote locations, lead to high freight costs and reduced competitiveness. Small islands tend to have high degrees of endemism and levels of biodiversity (number of species per square kilometre), but the relatively small numbers of the various species impose high risks of extinction and create a need for protection.

3. The small size of small island developing States means that development and environment are closely interrelated and interdependent. Recent human history contains examples of entire islands rendered uninhabitable through environmental destruction: small island developing States are fully aware that the environmental consequences of ill-conceived development can have catastrophic effects. Unsustainable development threatens not only the livelihood of people but also the islands themselves and the cultures they nurture. Climate change, climate variability and sea-level rise are issues of grave concern. Similarly, the biological resources on which small island developing States depend are threatened by the large-scale exploitation of marine and terrestrial living resources.

4. Many small island developing States are entirely or predominantly coastal entities. This requires that in pursuing development, special attention be paid to protecting the environment. It also requires the integrated management of resources. Due to the small size, isolation and fragility of island ecosystems, their renowned biological diversity is among the most threatened in the world.

5. Although their population density may be high, many small island developing States have small populations in absolute terms and thus limited scope for the full utilization of certain types of highly specialized expertise. They experience high levels of migration, particularly of skilled human resources, which not only places undue burden on training facilities but forces small island developing States to import high-cost foreign expertise.

6. The search for economies of scale, together with their narrow resource base, tends to limit the total production of small island developing States to a

narrow range of crops, minerals and industries. Any adverse development concerning these productive sectors, whether arising from market factors, natural or environmental constraints, is likely to lead to significant reductions in output, a fall in foreign-exchange earnings and increased unemployment.

7. Partly because of their small size and partly because of their vulnerability to natural and environmental disasters, small island developing States are often classified as high-rise entities, which has led to insurance and reinsurance, being either unavailable or exorbitantly expensive with adverse consequences for investment, production costs, government finances and infrastructure.

8. Because the per capita income of many small island developing States tends to be higher than that of developing countries as a group, they have been excluded from access to concessionary resources. Analysis of the economic performance of small island developing States however, suggests that current incomes are often facilitated by migrant remittances, preferential market access for some major exports and assistance from the international community. These sources are neither endogenous nor secure. Furthermore, incomes of small island developing States have generally been unsustainable over time: natural disasters, difficulties in the international market for particular commodities and recession in some developed economies often reduce incomes in small island developing States dramatically, sometimes by as much as 20 to 30 per cent of gross domestic product (GDP) in a single year.

9. Because small island development options are limited, they present special challenges to planning for and implementing sustainable development. Without the cooperation and assistance of the international community, small island developing States will be constrained in meeting these challenges (see Agenda 21, 1/ para. 17.127).

10. Sharing a common aspiration for economic development and improved living standards, small island developing States are determined that the pursuit of material benefits should not undermine cultural values nor cause any permanent harm to the land and marine resources which have sustained island life for many centuries.

11. In establishing the new global partnership for sustainable development, countries have recognized the need for special priority to be given to those that are most environmentally vulnerable (see the Rio Declaration on Environment and Development, 2/ Principle 6). More specifically, under chapter 17G of Agenda 21 small island developing States and islands supporting small communities are recognized as a special case for both environment and development, because they are ecologically fragile and vulnerable and their small size, limited resources, geographic dispersion and isolation from markets all place them at a disadvantage economically and prevent economies of scale (see Agenda 21, para. 17.124).

12. The following framework action programme addresses the special challenges and constraints facing small island developing States. Because sustainable development is a process, not a phenomenon, this framework action programme focuses on the next steps that can be taken along the comprehensive path to

sustainable development that was detailed in the regional technical meetings held in preparation for the Global Conference, a path which will follow the principles endorsed by Governments at the United Nations Conference on Environment and Development. The programme contains a synopsis of actions and policies that should be implemented over the short, medium and long term. These are elaborated in greater detail in the reports of the regional technical meetings, which contain a broader collection of actions that will be required over the longer term.

13. Within this context, and in accordance with the objectives defined in General Assembly resolution 47/189, the programme presents a basis for action under 15 agreed priority areas and defines a number of actions and policies related to environmental and development planning that should be undertaken by small island developing States with the cooperation and assistance of the international community. Elements for inclusion in the medium and long-term sustainable development plans of small island developing States are recommended; regional approaches to sustainable development/environment problems and technical cooperation are proposed; and the role of the international community is outlined, including how it might provide access to adequate, predictable new and additional financial resources and mechanisms in accordance with chapter 33 of Agenda 21. In addition, measures are proposed for enhancing endogenous capacity-building at national, regional and international levels, in particular for developing human resources and promoting access by small island developing States to environmentally sound and energy-efficient technology for their sustainable development.

14. This action programme shall be consistent with and does not duplicate a number of parallel international processes important to the sustainable development of small island developing States, which contain relevant provisions. These processes include the Commission on Sustainable Development; the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change; the Convention on Biological Diversity; 3/ the United Nations Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks; the United Nations Convention on the Law of the Sea; 4/ the International Conference on Population and Development; the Intergovernmental Negotiations on Land-based Sources of Marine Pollution of the United Nations Environment Programme (UNEP); the Intergovernmental Negotiating Committee on Drought and Desertification; and the World Coast Meeting. Support for the participation of small island developing States in these processes will be important and these processes will need to reflect the outcome of the Global Conference on the Sustainable Development of Small Island Developing States.

15. As recognized in Agenda 21, Governments will be primarily responsible for the implementation of the action programme. The sustainable development of small island developing States will require the development of national strategies, plans, policies and processes. International cooperation will also be essential to support and complement such national efforts. The United Nations system has a key role to play, in close cooperation and coordination with other international, regional and subregional organizations, which are called upon to contribute in large measure to this effort. For small island developing States, regional and subregional efforts have proved successful and will remain the principal instruments for collective action. Finally, as

recommended in Agenda 21, the broadest public participation and the active involvement of non-governmental organizations and other groups are encouraged.

I. CLIMATE CHANGE AND SEALEVEL RISE

Basis for action

16. Small island developing States are most vulnerable to global climate change, variability and sealevel rise. As most populations, agricultural lands and infrastructures of small island developing States exist in the coastal zone, any rise in sealevel will have significant and profound effects on the economies of these countries. The very survival of certain low-lying countries would be threatened by sealevel rise. Inundation of outlying islands and loss of land above the high-tide mark may result in loss of exclusive economic rights over extensive areas. Global climate change may damage coral reefs, alter the distribution of zones of upwelling and may affect both subsistence and commercial fisheries production. Further, it may impact on vegetation and saline intrusion may adversely affect freshwater resources. The increased frequency and intensity of storm events that may result from climate change will also have profound effects on both the economies and the environment of small island developing States. More information is required concerning all these aspects of climate change as it may affect small island developing States to enable appropriate response strategies to be developed and implemented.

17. The Framework Convention on Climate Change is expected to make a significant contribution to reducing the threat of climate change as well as mitigating and assisting countries to adapt to the impacts of climate change and sealevel rise. The Convention, however, does not contain targets and timetables for the reduction of carbon dioxide and other greenhouse gas emissions and these are seen by small island developing States as essential to address climate change in any meaningful way. The development and use of renewable energy resources and the dissemination of sound and efficient energy technologies are also seen as having a central role in mitigating the adverse impacts of climate change. These issues can be addressed through elaboration of the Convention.

A. National action, policies and measures

(i) Ensure early ratification or accession to the Framework Convention on Climate Change, the Montreal Protocol and other related legal instruments.

(ii) Formulate comprehensive adjustment and mitigation policies for sealevel rise in the context of integrated coastal area management.

(iii) Assess the effects and the socio-economic implications of the impact of climate change, climate variability and sealevel rise on small island developing States.

(iv) Map areas vulnerable to sealevel rise and develop computer-based information systems covering the results of surveys, assessments and observations as part of the development of adequate response

strategies, adaptation policies and measures to minimize the impact of climate change, climate variability and sealevel rise.

(v) Improve public and political understanding of the potential impacts of climate change.

(vi) Promote more efficient use of energy resources in development planning and use appropriate methods to minimize adverse effects of climate change on their sustainable development.

B. Regional action

(i) Create, and/or strengthen, programmes and projects to monitor and improve predictive capacity for climate change, climate variability and sealevel rise and to assess the impacts of climate change on marine resources, freshwater and agricultural production, including pests.

(ii) Develop and/or strengthen mechanisms to facilitate the exchange of information and experiences between small island developing States, and to promote technology transfer and training in small island developing States in response to climate change, including preparedness response and early warning systems.

(iii) Provide technical assistance for ratification or accession to the Framework Convention on Climate Change and assist those which have ratified the Convention to assume their major responsibilities.

C. International action

(i) Implement immediately the prompt-start resolution agreed to by the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change.

(ii) Provide improved access to financial and technical resources for monitoring climate variability and change and sealevel rise, for assessment of the impacts of climate change, and for the timely development and implementation of response adaptation strategies, recognizing the specific vulnerabilities and disproportionate cost borne by small island developing States.

(iii) Provide improved access to information from the activities carried out to reduce uncertainties of climate change and assist the inter-island exchange of this information.

(iv) Provide access to environmentally sound and energy efficient technology to assist small island developing States to conserve energy.

(v) Support the activities of intergovernmental regional and subregional organizations aimed at assisting small island developing States to cope effectively and creatively with climate change, climate variability and sealevel rise, including systems for systematic and

continuous research, monitoring and assessment of climate change, climate variability and sealevel rise, coral reefs, the role of oceans in the world climate, tidal variations and salt water intrusion of freshwater.

II. NATURAL AND ENVIRONMENTAL DISASTERS

Basis for action

18. Small island developing States are prone to extremely damaging natural disasters, primarily in the form of cyclones, volcanic eruptions and earthquakes. In some islands, the range of these disasters includes storm surges, landslides, extended droughts and extensive floods. A recent study by the Office of the United Nations Disaster Relief Coordinator has shown that at least 13 of the 25 most disaster-prone countries are small island developing States. Due to climate change, such events, including drought, are perceived to be occurring with increasing frequency and intensity. These natural disasters are of special concern to small island developing States because of their small size, narrow resource base and the pervasive impact of such events on their economies. For those affected by these natural disasters these particular characteristics mean that the economic, social and environmental consequences are long-lasting and the costs of rehabilitation are high as a percentage of GNP. For similar reasons the impact of environmental disasters can also be severe.

19. Evidence of increased incidence and impact of natural and environmental damage is provided by recent huge rises in insurance premiums on property and the withdrawal by large international insurance companies of reinsurance facilities for small islands.

20. Efforts are being made at national and regional levels to improve management and preparedness and the provision of disaster relief. Because the same threats and dangers face many neighbouring islands, there is much scope for regional action and international support for such action.

A. National action, policies and measures

(i) Establish and/or strengthen disaster preparedness and management institutions and policies, including building codes, to mitigate, prepare for, and respond to the increasing range and frequency of natural and environmental disasters and promote early warning systems and facilities for the rapid dissemination of information and warnings.

(ii) Strengthen the capacity of local broadcasting to assist remote atolls in the country and the neighbouring countries during disaster events.

(iii) Establish a national disaster emergency fund with joint private and public sector support for areas where insurance is not available in the commercial market.

(iv) Integrate natural and environmental disaster policies into national development planning and encourage the development of public and private sector disaster recovery plans, within the framework of the Office of the United Nations Disaster Relief Coordinator, by the year 2000.

(v) Strengthen cultural and traditional systems that improve the resilience of local communities to disaster events.

B. Regional action

(i) Establish and/or strengthen, where appropriate, regional institutions to complement and support national efforts in disaster mitigation, preparedness and management.

(ii) Establish and/or strengthen, where appropriate, mechanisms for sharing experience, information and resources, including expertise, between small island developing States.

(iii) Increase access to telecommunication links and satellite facilities for disaster monitoring, assessment and information exchange.

(iv) Establish and/or strengthen existing regional mechanisms and communication systems for rapid response to disasters.

C. International action

(i) Assist small island developing States to establish national and regional institutional mechanisms and policies to reduce the impacts of natural disasters, improve disaster preparedness and integrate natural disaster considerations in development planning, including through access to resources for disaster mitigation, preparedness, response and recovery.

(ii) Improve access to technology and relevant training to assist with hazard and risk assessment and early warning systems, and to assist with the protection of islands from environmental disasters consistent with national and regional strategies for disaster management.

III. MANAGEMENT OF WASTES

Basis for action

21. Limited land areas and resources for safe disposal, growing populations and increasing imports of polluting and hazardous substances combine to make pollution prevention and the management of wastes a critical issue for small island developing States. Wastes in small island developing States tend to be highly visible, but due to limited capacity to monitor the waste stream the true extent of the problem remains poorly understood. For small island developing States, the disposal of wastes is a serious constraint to sustainable development. Both land and sea-based sources of pollution require urgent attention.

22. All small island developing States share the problem of safely disposing of solid and liquid wastes, particularly as a result of urbanization, resulting in contamination of groundwater and lagoon areas. Point source pollution from industrial wastes and sewage, inappropriately sited and poorly managed garbage dumps and disposal of toxic chemicals are significant contributors to marine pollution and coastal degradation. Limited land areas makes the option of landfill disposal unsustainable in the long term. Incineration, while reducing the volume of wastes, is prohibitive in terms of costs and still requires disposal of ash containing potentially hazardous substances in high concentration. Pressure on forests to provide fuelwood and to expand agricultural development along with a high use of agricultural chemicals also aggravate downstream pollution and sedimentation problems.

23. There is also growing concern about the transboundary movement of toxic and hazardous waste, including the use of small island developing States for the disposal of waste generated by other countries. The isolation and oceanic location of small island developing States and their dependence on a marine and limited terrestrial resource base make them highly vulnerable to contamination by toxic and hazardous wastes and chemicals, and radioactive materials. The passage of oil tankers, cruise ships and ships carrying toxic and nuclear materials and wastes through the seas of small island developing States is now of priority concern.

24. Given that long-term disposal options are limited and will constrain sustainable development, small island developing States will need to look for ways of minimizing wastes and/or converting wastes, such as sewage, into a resource (e.g. fertilizer for agriculture). This will include action ranging from limiting imports of non-biodegradable and hazardous substances to changing community attitudes to the disposal and use of sewage. In the short term, existing wastes require effective disposal, but at the same time incentives to continue waste generation should be avoided.

A. National action, policies and measures

(i) Develop fiscal and policy incentives and other measures to encourage environmentally sustainable imports and local products with low waste or degradable waste content.

(ii) Develop and implement appropriate regulatory measures, including emission discharge and pollution standards, for the reduction, prevention, control and monitoring of pollution from all sources and for the safe and efficient management of toxic, hazardous and solid wastes, including sewage, herbicides, pesticides and industrial and hospital effluent, together with proper management of disposal sites.

(iii) Ratify and implement relevant conventions, including the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal 5/ and the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention of 1972) 6/ and relevant regional conventions.

(iv) Formulate and implement public awareness and education campaigns designed to gain local recognition of the need to control wastes at

the source, the value of reuse and recycling, of appropriate packaging, and of the possibilities to convert wastes to resources in culturally appropriate ways.

(v) Introduce clean technologies and treatment of waste at the source and appropriate technology for solid waste treatment.

(vi) Develop information systems and baseline data for waste management and pollution control, monitoring the types and quantities of wastes, for both sea and land-based sources of pollution.

(vii) Establish port reception facilities for the collection of waste in accordance with annex V of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78). 7/

B. Regional action

(i) Develop regional pollution prevention programmes, including regional centres for pollution prevention, involving demonstration projects, workshops and multimedia presentations tailored to specific groups, the development of economic incentives to further pollution prevention and waste management, relevant legislation, a coordinated and focused monitoring programme and the development of waste management and prevention trust funds.

(ii) Remove and dispose of existing hazardous wastes, such as polychlorinated biphenyls, with the technical assistance of developed countries.

(iii) Establish clearing-houses for information on the sources, levels, amounts, kinds, trends and effects of pollution and waste on marine and coastal systems, and on processes and technology to address pollution control from land and sea-based sources.

(iv) Establish regional mechanisms, including conventions where appropriate, to protect the oceans, seas and coastal areas from ship-generated waste, oil spills and the transboundary movement of toxic and hazardous waste.

(v) Examine ways to resolve disputes concerning waste disposal practices affecting islands and encourage a collaborative approach to international compensation and penalties for breaches of international agreements.

(vi) Facilitate the formulation and implementation of public awareness and education campaigns designed to gain local recognition of the need to control wastes at the source, the value of reuse and recycling, of appropriate packaging, and of the possibilities to convert wastes to resources in culturally appropriate ways.

C. International action

(i) Support the strengthening of national capabilities to carry out pollution monitoring and research and to formulate and apply pollution control and abatement measures.

(ii) Support the strengthening of institutions to provide assistance to Governments and industry in the adoption of clean production technologies as well as for the prevention of pollution and in the handling, treatment and disposal of hazardous wastes.

(iii) Accept the right of small island developing States to regulate, restrict and/or ban the importation of products containing non-biodegradable and/or hazardous substances and to prohibit the transboundary movement of hazardous and radioactive wastes and materials within their jurisdiction.

(iv) Ensure that the international conventions and related negotiations on land based sources of marine pollution, including any amendments to the London Convention of 1972 take into account the interests and capacities of small island developing States.

(v) Assist the implementation of monitoring and pollution prevention programmes and the establishment of port reception facilities for the collection of waste in accordance with annex V of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78). 7/

(vi) Enhance international cooperation in the establishment of waste management facilities, the control of toxic chemicals and pollution prevention as components of international investment projects, whether funded by multilateral or private sources.

(vii) Assist small island developing States with the development of land-based marine pollution strategies to assess the impact of marine pollution and mechanisms to eliminate or minimize the pollution source.

(viii) Provide improved access to resources for national and regional efforts to formulate and implement public awareness and education campaigns designed to gain local recognition of the need to control wastes at the source, the value of reuse and recycling and of appropriate packaging, and of the possibilities for converting wastes to resources in culturally appropriate ways.

IV. COASTAL AND MARINE RESOURCES

Basis for action

25. Sustainable development in small island developing States depends largely on coastal and marine resources. Their small land area means that small island developing States are effectively coastal entities. Population and economic

development - both subsistence and cash - are concentrated in the coastal zone. The establishment of the 200-mile exclusive economic zone has vastly extended fisheries and other marine resources available to small island developing States. The high dependence of small island developing States on coastal and marine resources emphasizes the need for appropriate and effective management.

26. The development and management of programmes designed to achieve ecologically and economically sustainable utilization of coastal and marine resources are major challenges for small island developing States. The lack of an integrated approach to coastal and marine area management has limited the effectiveness of past and present management measures. This is increasingly resulting in coastal habitats being degraded through pollution, natural resources being overexploited and growing conflicts between competing resource uses. Development patterns have also had an adverse impact on traditional management systems.

27. In many cases these impacts have been exacerbated by the effects of natural hazards and extreme events, such as hurricanes/cyclones/typhoons, storm surges and abnormally high tides. Action programmes which promote the sustainable use of coastal and marine resources must be vigorously pursued. These should be linked to and coordinated with other activities related to the sustainable development of coastal and marine resources, such as biodiversity conservation and response strategies for climate change.

A. National action, policies and measures

(i) Establish and/or strengthen, where necessary, institutional and administrative arrangements for the development of integrated coastal zone management plans and strategies for the exclusive economic zones and their implementation, including integration within national development plans.

(ii) Design comprehensive monitoring programmes for coastal and marine resources, including wetlands, to determine shoreline and ecosystem stability, and document and apply traditional knowledge and management practices which are ecologically sound, as a basis for integrated coastal zone planning and decision-making.

(iii) Develop and/or strengthen national capabilities for the sustainable harvesting and processing of fishery resources and provide training and awareness programmes for the managers (government and local communities) of coastal and marine resources.

(iv) Ratify and/or adhere to regional and international conventions concerning protection of coastal and marine resources and combat unsustainable fishing and related practices.

B. Regional action

(i) Develop and/or strengthen the capacity of regional organizations to undertake activities in coastal and marine areas, including research on commercial and non-commercial fisheries with regard to sustainable harvesting and utilization, and surveys on reef, estuary and lagoon

resources; and monitor and promote innovative ways to sustainably develop territorial waters and exclusive economic zones, including support for aquaculture, mariculture, coral reef and mangrove programmes.

(ii) Develop methodology for integrated coastal zone management appropriate to small island developing States, particularly very small, low elevation and coral islands.

(iii) Develop and/or strengthen regional clearing-houses for coastal and marine environmental information so as to facilitate the collection, synthesis and sharing of relevant information, knowledge and experience among small island developing States in a structured and systematic way.

(iv) Develop programmes to enhance negotiating and related skills for the management and exploitation of coastal and marine resources, including the negotiation of fisheries agreements.

(v) Develop and/or strengthen regional capabilities for the effective surveillance and monitoring of activities in the exclusive economic zones.

(vi) Harmonize policies and strategies for coordination of the sustainable management and utilization of coastal and marine resources.

C. International action

(i) Develop mechanisms for the gathering and sharing of information and expertise, particularly interregionally between small island developing States, including geographic information systems (GIS) techniques and facilities for the assessment of coastal and marine resources, including the regional nodes of the UNEP Global Resource Information Database.

(ii) Cooperate in facilitating mutually advantageous fishing agreements between small island developing States and foreign fishing groups; take account of the special concerns and characteristics of small island developing States within the United Nations Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks; and support the full participation of small island developing States in any Conference outcomes.

(iii) Assist with the establishment and/or strengthening, where necessary, of new institutional and administrative arrangements for the development of integrated coastal zone management plans and their implementation.

(iv) Support small island developing States in establishing national and regional capabilities for effective surveillance and monitoring of activities within the exclusive economic zone, in the setting up of regional and other joint-venture fishing enterprises, in developing inventories of marine resources and regional approaches to the

sustainable management of the exclusive economic zone and in the strengthening of regional marine research centres.

V. FRESHWATER RESOURCES

Basis for action

28. Freshwater resources are vital for meeting basic needs and inadequate protection of the quality and supply of freshwater resources can set important limits to sustainable development. Many health hazards in developing countries are related to poor water quality. Because of their small size and particular geological, topographical and climatic conditions, many small island developing States face severe constraints in terms of both the quality and quantity of freshwater. This is particularly the case for low-lying coral-based islands where groundwater supplies are limited and they are protected only by a thin permeable soil. Even where rainfall is abundant, access to clean water has been restricted by lack of adequate storage facilities and effective delivery systems.

29. A common threat to the freshwater resources of small island developing States is the contamination of supply by human and livestock waste, industry-related pollution and, in some cases, pesticides and other agricultural chemicals. With climatic change comes an increased risk of salt-water intrusion into the groundwater table. Such incursion is made even more likely through low groundwater recharge in times of extended drought. Inadequate action to safeguard watershed areas poses a further long-term threat, while in urban areas rapid population growth, changes in economic strategies and a growing per capita use of freshwater are significant challenges. Certain industries, including tourism and canning operations are profligate users of water.

A. National action, policies and measures

(i) Develop, maintain and protect watershed areas, irrigation systems, distribution networks and appropriate catchment systems and promote effective water conservation programmes through, inter alia, the development of integrated national water plans, the use of appropriate incentives and regulatory measures, community involvement in management and conservation, forest management and reforestation and investment strategies.

(ii) Develop and strengthen low-cost monitoring and assessment capabilities, linked to water resource databases, for relevant decision-making tools including forecasting models for water management, planning and utilization.

(iii) Strengthen procedures to monitor and respond to the impacts of natural and environmental hazards, in particular the impacts of climate change and climate variability, including drought and sealevel rise, on water resources.

(iv) Encourage the development and acquisition of appropriate technology and training for cost-effective sewage disposal, desalination and rainwater collection to provide sufficiently high quality potable freshwater.

B. Regional action

(i) Develop and strengthen initiatives for regional cooperation in training and research to assist Governments in the development and implementation of integrated water resource plans, including conservation and rehabilitation of watersheds, protection of groundwater, fostering public awareness and water quality monitoring.

(ii) Provide technical assistance for the assessment and/or development and transfer of appropriate technology for water collection, distribution and protection, in particular, sewage disposal technology.

C. International action

(i) Improve access to environmentally sound and energy efficient technologies for the catchment, production, conservation and delivery of freshwater, including rainwater catchment, water treatment systems and desalination, and foster the exchange of information on water treatment methods.

(ii) Enhance small island developing States' capacity to develop and implement integrated water resource plans, including conservation and rehabilitation of watersheds, protection of groundwater, fostering public awareness and water quality monitoring.

(iii) Assist training and public awareness campaigns to build up an endogenous capacity relating to water management and conservation and appropriate rainwater catchment systems.

(iv) Support the establishment of methodologies aimed at assessing the adverse impact of climate change on freshwater resources and develop appropriate response and mitigation measures.

VI. LAND RESOURCES

Basis for action

30. The small size of most small island developing States, coupled with land tenure systems, soil types, relief and climatic variation, limit the area available for urban settlement, agriculture, mining, commercial forestry, tourism, and other infrastructure, and create intense competition between land use options. Most aspects of environmental management in small island developing States are directly dependent on, or influenced by, the planning and utilization of land resources. This is intimately linked to coastal zone management and protection in small island developing States.

31. For human requirements to be met in a sustainable manner, conflicts between the use of land resources must be resolved, and more effective and efficient ways of using these natural resources developed and adopted. As populations grow in small island developing States the need for conflict resolution becomes ever more pressing, particularly where large tracts of land are utilized for commercial exploitation or where land is limited, resulting in unsustainable use of resources, with resultant severe land degradation.

32. The major long-term land management issue in small island developing States is degradation of the limited land area due to a variety of factors, including overuse because of high population pressure on a limited resource base; deforestation due to unsustainable commercial logging or permanent conversion to agricultural or grazing pursuits; and other episodic events, such as fire. Natural events such as catastrophic cyclones are also major contributors. Land degradation of this kind results in accelerated erosion and resultant decline in fertility and productivity, deterioration in water quality and siltation of rivers, lagoons and reefs. Deforestation is also linked to a decline in the continuity and quality of village water supply, depletion of genetic, wood and non-wood plant resources, and the fading away of traditional forest, lagoon and reef-based subsistence life systems.

33. The search for an improved quality of life, with its increased demands for cash income, has led to greater production of export cash crops, increasing areas of cultivation and more mechanized production systems. This has contributed to an increasing rate of agro-deforestation and loss of multiple purpose trees from the rural landscape and agrochemical pollution of soils, freshwater and coastal resources. There is, however, much that can be learned from traditional systems of food production and use of plants.

A. National action, policies and measures

(i) Develop and improve national databases and the dissemination of information to relevant groups, especially local communities and women, for land-use planning and management, including estimates of carrying capacity, economic and environmental value of land resources, along with appropriate decision-making tools, such as land/geographic information systems.

(ii) Prepare and/or review land-use plans in conjunction with agricultural, forestry, mining, tourism, traditional land-use practices and other land-use policies, with a view to formulating comprehensive land-use plans and zoning, so as to protect land resources, ensure sustainable and productive land-use and guard against land degradation, pollution and exceeding island carrying capacity.

(iii) Encourage appropriate forms of land tenure and a greater appreciation of the integrated nature of land development in order to facilitate sustainable land-use.

(iv) Formulate and enforce laws, regulations and economic pricing and incentives to encourage the sustainable and integrated use, management and conservation of land and its natural resources.

(v) Support appropriate afforestation and reforestation programmes, with appropriate emphasis on natural regeneration and participation of land owners, to ensure watershed and coastal protection and reduce land degradation.

(vi) Improve the availability, affordability and environmental quality of shelter in human settlements, in accordance with chapter 7 of Agenda 21.

(vii) Increase attention to national physical planning in both urban and rural environments, with a focus on training to strengthen physical planning offices, including the use of environmental impact assessments and other decision-making tools.

B. Regional action

(i) Provide appropriate training and other capacity-building opportunities for small island developing States, including systems for continuous surveillance of the rate and extent of land-use changes and monitoring of adverse environmental effects, to facilitate the implementation of national actions.

(ii) Collect, synthesize and share relevant information, knowledge and experience among small island developing States on sustainable land-use practices and policies in a structured and systematic way, including issues pertaining to environmental, agricultural, forestry, mining and other land-based sectors, market intelligence information, and assessment of potential interested overseas investors.

C. International action

(i) Support the improved availability of shelter and the economic and environmental quality of human settlements for small island developing States in accordance with chapter 7 of Agenda 21.

(ii) Facilitate the development and improvement of national databases and the dissemination of information to relevant groups, especially local communities and women, for land-use planning and management including estimates of carrying capacity, economic and environmental value of land resources, along with appropriate decision-making tools such as land/geographic information systems.

(iii) Facilitate more effective international and interregional cooperation, coordination and collaboration in the fields of agriculture, forestry and other land-use, through international and interregional networks and training programmes.

VII. ENERGY RESOURCES

Basis for action

34. Small island developing States are currently heavily dependent on imported petroleum products, largely for transport and electricity generation, energy often accounting for more than 12 per cent of imports. They are also heavily dependent on indigenous biomass fuels for cooking and crop drying.

35. The small island developing States will continue to be heavily dependent on petroleum fuels and biomass both in the short and medium term. However, the current uses of these fuels tend to be highly inefficient. Increased efficiency through appropriate technology and national energy policies and management measures will reap both financial and environmental benefits for small island developing States.

36. Renewable energy resources endowments of small island developing States vary greatly. All have substantial solar resources, which have still not been developed to their full potential. Wind potential is highly variable with location, both within and between countries. Hydro electric power is a possibility only for some islands. Biomass endowment is common but unequal. Studies of the potential for geothermal, ocean thermal energy conversion and wave energy are continuing.

37. Several constraints to large-scale commercial use of renewable energy resources remain. These include technology development, investment costs, available indigenous skills and management capabilities. Small-scale application for rural electrification has been sporadic. The use of renewable energy resources as substantial commercial fuels by small island developing States is dependent on the development and commercial production of appropriate technologies.

A. National action, policies and measures

(i) Implement appropriate public education and awareness programmes, including consumer incentives to promote energy conservation.

(ii) Promote the efficient use of energy and the development of environmentally sound energy resources and energy efficient technologies, paying special attention to the increasing economic possibilities of renewable energy resources.

(iii) Establish and/or strengthen, where appropriate, research capabilities in the development and promotion of new and renewable sources of energy, including wind, solar, geothermal, hydroelectric, ocean thermal energy conversion wave and biomass.

(iv) Strengthen research capabilities and develop technologies to encourage the efficient utilization of non-renewable sources of energy.

B. Regional action

(i) Establish or strengthen research and policy capabilities in the development of new and renewable sources of energy, including wind, solar, geothermal, hydroelectric, wave and biomass.

(ii) Assist, where appropriate, in the formulation of energy policies, standards and guidelines for the energy sector applicable to small island developing States, and enhance national capacity to effectively plan, manage and monitor their energy sectors.

(iii) Gather and disseminate information, and promote regional cooperation and technical exchanges between small island developing States on energy-sector issues, including new and renewable sources of energy.

C. International action

(i) Support the research, development and utilization of renewable sources of energy and related technologies and improve the efficiency of existing technologies and end-use equipment based on conventional energy sources.

(ii) Formulate and ratify international agreements on energy-sector issues in relation to sustainable development in such areas as carbon emissions and the transportation of petroleum, for example, the use of double-hulled tankers.

(iii) Develop and agree to effective mechanisms for the transfer of energy technology and establish databases to disseminate information on experience in the use of new and renewable sources of energy as well as on the efficient use of non-renewable energy sources.

(iv) Ensure that international institutions and agencies incorporate environmental efficiency and conservation principles into energy-sector-related training and technical assistance and provide concessionary financing facilities for energy-sector reforms.

VIII. TOURISM RESOURCES

Basis for action

38. Tourism has contributed much to the development of small island developing States and, as one of only a few development options for small island developing States, will continue to be very important for their future growth. It could also stimulate the development of other sectors. However, if not properly planned and managed, it could significantly degrade the environment on which it is so dependent. The fragility and interdependence of coastal zones and the unspoilt areas on which eco-tourism depends calls for careful management. The special tourist attraction of small island developing States is the distinctiveness of their cultures. The diversity and fragility of their

environments are reflected in the diversity and fragility of their cultures. The protection of the former is an important condition for the protection of the latter.

39. Capital investment in tourism, particularly for the necessary infrastructure, is costly. There is usually also great competition for land resources between tourism, agriculture and other land uses. Large increases in tourism and overdevelopment of tourism in particular areas or in whole islands could be environmentally and culturally disruptive and detrimental to other valuable sectors, such as agriculture. It is imperative, therefcre, that the development of tourism be carefully planned, particularly in relation to compatible land uses, water management, coastal zone management and the development of parks. Tourism, like all forms of development in the coastal zone, needs to be carefully integrated within the existing cultural and environmental constraints and opportunities present within small island developing States. Eco-tourism, linking areas of high ecological value to low-impact tourism, may present important and environmentally sustainable opportunities for tourism development in small island developing States.

A. National action, policies and measures

(i) Ensure that tourism development and environmental management are mutually supportive.

(ii) Adopt integrated planning and policies to ensure sustainable tourism development, with particular attention to land-use planning, requiring environmental impact assessments for all tourism projects; continuous monitoring of the environmental impact of all tourism activities; and the development of guidelines and standards for design and construction to take into account energy consumption, the disposal of wastes and land degradation, management and protection of eco-tourism attractions, and the carrying capacity of areas for tourism.

(iii) Identify and develop facilities to meet specific niche markets, particularly in eco-tourism, nature and cultural tourism, providing increased support for cultural activities to protect the cultural integrity of small island developing States.

B. Regional action

(i) Ensure that tourism and the environment are mutually supportive in cooperation schemes at the regional level including, where appropriate, harmonization of standards and regulations.

(ii) Encourage the assessment and development of potential complementarities among small island developing States including the development of packaged options covering several islands and encouraging joint marketing and training programmes.

(iii) Establish or strengthen regional mechanisms for the exchange of information in the development of a safe and sustainable tourism sector, using, as appropriate, the capacities of regional tourism organizations.

C. International action

(i) Promote recognition of the value of tourism in small island developing States to the international community as well as the fragility of the resources on which tourism in small island developing States depends and of the need therefore for international support to encourage its sustainable development.

(ii) Facilitate efforts at the national and regional levels to assess the overall impact of the economic, social and ecological aspects of tourism, to plan sustainable tourism and to develop eco- and cultural tourism.

IX. BIODIVERSITY RESOURCES

Basis for action

40. Small island developing States are renowned for their species diversity and endemism. However, due to the small size, isolation and fragility of island ecosystems, their biological diversity is among the most threatened in the world. Deforestation and coral reef deterioration are the most significant causes of loss of biodiversity in small island developing States.

41. In the past, there has been a strong emphasis on the collection of more information. In small island developing States where limited and biologically precious resources are being threatened, while lack of sufficient information is often cited as a rationale for inaction, there is often enough information to identify areas requiring in situ conservation. Although more information will be important to develop appropriate management plans, information collection should no longer be a prior condition for in situ conservation projects.

42. The nature of traditional, often communal land and marine resource ownership in many island countries requires community support for the conservation effort. Without this local support and commitment and the opportunity to integrate sustainable income generation into the conservation effort, even the most highly studied and well planned conservation area will not be sustainable.

43. Some of the most precious biological resources for islanders, environmentally, economically and culturally, are marine and coastal rather than terrestrial. This requires a different conservation focus from that usual in the larger, developed countries. Other differences include the inadequacy of basic institutional support for the conservation effort (staff, vehicles etc.) and access to reserves of money to help start innovative projects.

44. A number of international and regional conventions exist concerning the conservation and sustainable utilization of biological resources and these are expected to provide a sound legal framework of potential benefit to the sustainable development of small island developing States.

A. National action, policies and measures

(i) Formulate and implement integrated strategies for the conservation and sustainable use of terrestrial and marine biodiversity, including identification of sites of high biological significance for the conservation of biological diversity and/or for eco-tourism and other sustainable development opportunities, such as sustainable agriculture, training and research.

(ii) Ratify and implement the Convention on Biological Diversity, the Convention on International Trade in Endangered Species of Wild Fauna and Flora and other relevant international and regional conventions.

(iii) Promote community support for the conservation of biological diversity and the designation of protected areas through concentration on educational strategies that increase awareness of the significance of biodiversity conservation and particularly the fundamental importance of a diverse biological resource base to resource-owning communities.

(iv) Generate and maintain buffer stocks or gene banks of biogenetic resources for reintroduction into the environment, especially in the case of post-disaster restoration and rehabilitation.

(v) Develop or continue studies and research on biological resources, their management and their intrinsic socio-economic and cultural value, including biotechnology.

(vi) Conduct detailed inventories of existing flora, fauna and ecosystems to provide basic data needed for the preservation of biodiversity.

B. Regional action

(i) Encourage countries to concentrate on known, existing sites of biological significance and to build up community support for the protection of these areas.

(ii) Promote regional studies of the socio-economic and cultural value of biological resources, including genetic engineering, intellectual property rights, and access to biotechnology, with the participation of existing or strengthened scientific institutions, relevant international agencies and non-governmental organizations.

(iii) Promote the establishment of regional gene-bank centres for research, seeking the development and introduction of more resistant and productive varieties of species, and provide the appropriate legal and technical procedures for the use of these biological resources.

(iv) Coordinate information exchange, training and technical assistance in support of national efforts to establish and manage conservation areas and for species conservation, including the identification and use of traditional knowledge and techniques for resource management which assist the conservation of biological resources and diversity.

(v) Promote and/or strengthen already existing regional scientific institutions which can operate as reference centres for problems related to the conservation and sustainable management of biodiversity.

(vi) Strengthen the capacity of regional organizations to provide technical support and coordination in the development of inventories of flora, fauna and ecosystems and where feasible to establish regional databases and gene banks.

C. International action

(i) Provide improved access to financial and technical resources for the conservation of biological diversity, including funds for basic institutional and logistic support for the conservation and management of biological diversity.

(ii) Improve access to environmentally sound biotechnology, including know-how and delivery mechanisms.

(iii) Ensure that the activities of relevant international organizations, agencies and programmes of the United Nations as well as of relevant non-governmental organizations, are closely coordinated with and supportive of identified regional small island developing States centres or ongoing programmes in the conservation and sustainable use of biodiversity and biotechnology.

(iv) Make greater use of import restrictions under the Convention on International Trade in Endangered Species of Wild Fauna and Flora on products from endangered species of small island developing States.

(v) Support national and regional actions for developing inventories of flora, fauna and ecosystems, including training and technical assistance.

X. NATIONAL INSTITUTIONS AND ADMINISTRATIVE CAPACITY

Basis for action

45. To address the environmental resources management priorities essential to the sustainable development of small island developing States, national institutional and administrative arrangements are increasingly embracing the interrelated nature of activities in the limited land area. The integration of environmental considerations into the national decision-making processes is considered to be the single most important step to be taken by small island developing States to ensure that these problems are addressed and that the principles of sustainability guide all future development.

46. Economic imperatives must be evaluated from the perspective of socio-environmental considerations if the natural resource base is to be preserved for the benefit of present and future generations and social and cultural values safeguarded. Economic development must become sustainable

development by incorporating environmental and resource management. This requires the adoption of interdisciplinary approaches to both planning and decision-making.

47. Formal integration of economic and environmental considerations will necessitate a series of institutional adjustments within government administrations, accompanied by across-the-board strengthening of environmental administrative capacity. Many forms of institutional adjustment are conceivable and would be tailored to specific country needs.

48. Many countries have prepared environmental strategies and plans which integrate environment and development and these are seen as the first step in a process leading to the wide application of sustainable development principles. For these plans to promote sustainable development, however, they must be utilized for national decision-making at the central levels of government in order that environment and development policy can be carefully integrated.

A. National action, policies and measures

(i) Strengthen institutional arrangements and administrative capacity, including cross-sectoral/inter-ministerial committees and task forces, to integrate environment and economic policy in national planning and across sectors and ensure capacity to implement Agenda 21 and the decisions of the Global Conference.

(ii) Develop implementation strategies and schedules, including financing, for both regional and national activities.

(iii) Establish or strengthen environmental agencies with adequate financial and staff resources.

(iv) Increase the awareness and involvement of non-governmental organizations, local communities and other major groups in public education, national planning and implementation of sustainable development programmes.

(v) Improve public education to familiarize local, provincial/State and national bodies with environmental laws already in existence, to facilitate discussion of the value of environmental legislation and standards to local communities and to open wider discussion on more culturally appropriate penalties for contravention of laws and regulations.

(vi) Develop appropriate national, provincial/State and local environmental regulations which reflect the needs and incorporate the principles of sustainability, create appropriate environmental standards and procedures, and ensure their integration into national planning instruments and development projects at an early stage in the design process, including specific legislation for appropriate environmental impact assessment for both public and private sector development.

(vii) Give sustainable development task forces or their equivalent official authority and validity to permit their continued meeting as interdisciplinary and communally representative advisory bodies.

(viii) Provide adequate resources for the enforcement of environmental regulations.

(ix) Enact domestic legislation required for the implementation of the wide range of international environmental conventions and agreements directly relevant to small island developing States.

(x) Establish national information nodes on the sustainable development of small island developing States, to encourage, at the international level, the development of a small islands' sustainable development information network to facilitate the exchange of experience among small island developing States.

B. Regional action

(i) Assist, where appropriate, with the implementation of national environmental strategies.

(ii) Provide appropriate research, training and information dissemination to facilitate the mainstreaming of environment in development planning and decision-making and coordination between sectors.

C. International action

(i) Improve access to financial and technical assistance to strengthen national institutions and administrative and operational capacity.

(ii) Support the development of a small islands' sustainable development information network to facilitate the exchange of experience among small island developing States.

XI. REGIONAL INSTITUTIONS AND TECHNICAL COOPERATION

Basis for action

49. The limited human resources and small size of small island developing States makes it especially necessary to pool these resources through regional cooperation and institutions. It is essential that effective support for regional projects be coordinated through regional bodies. This is desirable to avoid duplication and achieve complementarity of assistance.

50. Regional organizations can play a useful role to facilitate efficient and cost-effective assistance to small island developing States. Regional organizations are also useful vehicles, in many instances, for implementation of regional programmes. Programming, administrative and implementation capacities of those bodies can further be improved with the support of member nations and donors.

51. Currently multilateral and bilateral donors undertake their own regional programming exercises through regular dialogue with small island developing States and relevant bodies. Non-governmental organizations also deliver services at the national and regional levels in support of regional programmes.

A. National action, policies and measures

(i) Support regional organizations through membership and budgetary contributions.

(ii) Encourage improved coordination and collaboration among regional bodies and between the international community and regional programmes.

B. Regional action

(i) Improve coordination among regional bodies for the sustainable development of small island developing States as outlined in Agenda 21.

(ii) Formulate regional programmes and strategies jointly between regional bodies and national authorities consistent with Agenda 21.

(iii) Develop a small island developing States technical assistance programme to support sustainable development in small island developing States world wide.

(iv) Establish and, where appropriate, support regional sustainable development centres to facilitate the sustainable development of small island developing States in the areas of research, training, the development of endogenous technology, transfer of technology and the provision of legal and technical advice, taking into account the work of existing relevant institutions, including universities.

(v) Draft model environmental provisions as a guide for countries, leaving to each small island developing State the incorporation of country-specific provisions to reflect the variety and diversity of national and customary laws and procedures.

(vi) Prepare environmental law training manuals for both lawyers and others working in the environmental field.

(vii) Conduct regional and in-country workshops on environmental law subjects, including environmental conventions and treaties, environmental impact assessment, heritage, pollution, civil enforcement, prosecution and environmental mediation.

(viii) Assess and inform small island developing States about the content, notification processes, financial and legal implications of relevant international environmental instruments and conventions in order to encourage small island developing States to accede to and implement them.

C. International action

(i) Support environmental law offices within regional and subregional organizations to implement regional approaches, including the development of relevant expertise.

(ii) Improve access to financial and technical resources for the development and/or strengthening of regional bodies in order to respond to the sustainable development needs of small island developing States.

(iii) Improve coordination with relevant regional/subregional bodies to implement Agenda 21 and the decisions of the Global Conference.

(iv) Strengthen regional bodies in order to improve their capacity to respond to the sustainable development needs of small island developing States.

XII. TRANSPORT AND COMMUNICATION

Basis for action

52. Transport and communications are the lifelines linking small island developing States with the outside world, with each other and within their own communities, and are integral to achieving the development aspirations of those countries. Distance and isolation for many small island developing States have resulted in relatively high transport and insurance costs, both sea and air. Shipping and air services are largely beyond the control of island countries, while their servicing of outer islands and remote rural communities presents further constraints. Domestic markets which are too small to provide significant economies of scale and limited export volumes often lead to high freight costs and reduced competitiveness. High air-transport costs also relate to the operation of national airlines that tend to fragment regional markets. The constraining influence of these factors on the sustainable development of island countries, cannot be underestimated.

53. The environmental, including quarantine, uses associated with transport and communications development also need to be properly addressed. Such issues include land transport, which has been found to be one of the greatest degraders of the urban environment, both at national and regional levels and which appears to have lagged behind improvements and major changes in transport services.

54. A major challenge is to devise innovative approaches to resolving transport problems, for example, the development of low-cost high-tech methods for the moving of cargo, and to improving community access to telephone, radio and related services.

A. National action, policies and measures

(i) Continue efforts to strengthen transport services and facilities at both the national and local levels, with particular attention to environmental protection, safety and to innovative low-cost transport solutions.

(ii) Upgrade domestic communication facilities, including radio and telephone coverage to remote rural communities, and continue efforts to improve international telecommunications links.

(iii) Address quarantine problems and requirements stemming from changing transport situations and longer-term climatic changes.

B. Regional action

(i) Foster increased cooperation in civil aviation, shipping and telecommunications, including possibilities for consolidation of national airline services.

(ii) Develop effective quarantine services through upgrading existing plant protection and related programmes.

(iii) Encourage the application of appropriate communications technologies to promote sustainable development in areas such as education, health, eco-tourism and other areas critical to sustainable development, including the promotion of greater public awareness.

C. International action

(i) Develop innovative energy-efficient transport solutions to move people and cargo to and from island ports without the need to establish high-cost infrastructure.

(ii) Cooperate with national and regional bodies in designing and enforcing effective quarantine systems.

(iii) Improve access to financial and technical resources in support of regional organizations which are coordinating and advising small island developing States in the fields of transport and communications.

(iv) Promote research and development in telecommunications and transportation relevant to the sustainable development of small island developing States.

(v) Promote arrangements and measures to lower the international telecommunications costs to small island developing States.

XIII. SCIENCE AND TECHNOLOGY

Basis for action

55. Science and technology are crucial for the achievement of sustainable development. There is need for much technological change in all countries to incorporate environmentally friendly technologies. However, in small island developing States science and technological capacity remains underdeveloped in terms of both research and development institutions and of the availability of scientists to serve such institutions on a sustained basis. At the same time, some island peoples survive on traditional knowledge and its application. These are being threatened in small island developing States increasingly driven to adopt technologies and scientific understanding. A better integration of contemporary and traditional knowledge is therefore required.

56. Science and technological capacity therefore require trained people to serve in production enterprises, to engage in training and to help in the assessment and adaptation of imported technologies. Many new environmentally sound technologies relevant to economic activities in small island developing States are coming on stream. Information concerning these and the ability to assess them are crucial for technological change to achieve sustainable development.

57. While small island developing States will continue to have a significant dependence on imported technologies, there are a number of sectors in which local capacity could be important, especially from the standpoint of moving quickly to environmentally sounder methods: agriculture, agricultural processing, construction, information technology, telecommunications and marine sciences are examples. Prospects for particular sectors and the location-specific nature of the work required point to areas in which small island developing States should concentrate in developing some endogenous capacity.

58. While sectors are limited in which research and development capacity could be built up in small island developing States, trained people are needed over a wider area to ensure adequate training and capacity for environmental impact and technology assessment. Limited national capacities mean that in a number of these areas, emphasis would have to be given to regional and subregional approaches and joint ventures with the international community. Encouragement of private sector involvement could also be very important because of limited governmental capacity to undertake both training and research and development.

A. National action, policies and measures

(i) Ensure that science and technology policy is closely linked to national environmental strategies and sustainable development plans and is responsive to local and sectoral sustainable development needs, emphasizing self-sufficiency and the minimization of import dependency.

(ii) Give greater emphasis to research and training for science and economic development generally as well as for environmental and technology assessment; refine analytical tools for natural resource

accounting; and encourage the development and use of information and communications technology to overcome size and isolation problems.

(iii) Promote research and development in areas where endogenous technologies and traditional practices have great relevance, including agriculture, agricultural processing, waste-recycling, ethnobiology and biotechnology, construction and renewable energy, ensuring that mechanisms are in place for the appropriate protection of intellectual property rights in accordance with relevant international conventions.

(iv) Encourage the use of endogenous environmentally friendly technologies through regulations, standards and economic incentives.

(v) Develop or ensure access to databases on environmentally sound technologies of local relevance and collect consistent time-series data for monitoring the performance of sustainable development.

(vi) Promote and strengthen the role of women in science and technology disciplines.

B. Regional action

(i) Develop or strengthen efforts to assist small island developing States assess technology, develop databases on environmentally sound technologies, conduct relevant research and development and training, develop appropriate information systems to share experience within and between small island developing States, through relevant regional organizations and institutions.

(ii) Encourage appropriate regional standards and the standardization of analytical methods as well as scientific inter-calibration exercises in order to facilitate the exchange of data.

(iii) Develop and strengthen regional ocean sciences networks with particular reference to data collection and dissemination of information relevant to small island developing States.

C. International action

(i) Facilitate access to and the development of environmentally sound technologies relevant to small island developing States, including coastal zone management and marine and ocean sciences, using, inter alia, joint ventures and financial mechanisms.

(ii) Strengthen coordination and networking of the various national centres, regional organizations and institutions and international organizations working in areas of science and technology to facilitate information flows, database creation and access, and greater collaboration and technical cooperation in programmes.

(iii) Encourage development within the international community, including the United Nations system and particularly through relevant activities of the Commission on Science and Technology for Development and the

Commission on Sustainable Development, of appropriate programmes in support of regional and national efforts to build the science and technology capacities of small island developing States, including those that increase the output and range of their limited human resources.

(iv) Take account of the needs of small island developing States in the Action Plan for Training in Integrated Coastal Zone Management being developed cooperatively by the United Nations Development Programme and the Division for Ocean Affairs and the Law of the Sea of the United Nations Secretariat.

(v) Facilitate the full involvement of scientists and other experts from small island developing States in marine scientific research.

(vi) Promote the free flow of, and access to, data and information resulting from marine scientific research, particularly as it relates to monitoring in small island developing States.

(vii) Accelerate development of the coastal module of the Global Ocean Observing System due to its particular importance to small island developing States.

XIV. HUMAN RESOURCE DEVELOPMENT

Basis for action

59. The smallness and vulnerability of small island developing States necessitates special attention to population issues, education and training, and health for effective human resource development. Human resource development cannot happen in a context of poor health services and nutrition and housing, low levels of female participation in development, inadequate family planning services and poor social services generally. High population densities and growth, as well as depopulation in some areas, are constraints to achieving sustainable development in many small island developing States. Increasing attention must be given to the concept of island carrying capacity and environmental health, especially for fragile and highly populated environments in urban areas, coastal zones and hillsides.

60. In this context, the strengthening of national educational and training mechanisms is a matter of high priority. This is essential to facilitate the flow of information on sustainable development issues and to enhance public awareness of the environment. A key requirement is to promote access to and improve the quality of basic education.

61. Science training is essential to developing environmental awareness. Training in environmental management and sustainable development are needed at all levels of the education system. For professional training, multidisciplinary approaches are needed. There is a demand for knowledge on the environment to meet both educational and professional needs. Areas in which more training is greatly needed are science and technology generally, technology assessment, environmental impact assessment, environmental management and

sustainable development, environmental chemistry, environmental engineering, physical planning and the development of geographic information systems, and information and communications technology.

62. Chapter 6 of Agenda 21 recognizes the close dependency of human health on a healthy environment and provides a list of priority actions. Although some small island developing States have implemented relevant activities, the overall improvement in the health of their populations continues to decelerate. Furthermore, the health conditions of vulnerable groups, such as poor women and children, have actually deteriorated in many cases.

A. National action, policies and measures

(i) Infuse sustainable development ideas into education curricula at all levels and promote participation by all groups, emphasizing the link between environment and social and economic issues, and continue to orient education systems to provide greater emphasis on science, mathematics and technical training.

(ii) Incorporate population issues into the mainstream of decision-making and planning mechanisms of government, including the development of comprehensive population policies consistent with sustainable development objectives.

(iii) Improve urban/rural settlements by giving priority to the improvement of basic services such as potable water, sewage disposal, shelter, education, family planning and health as well as the elimination of poverty; ensuring that development projects have explicit environment and health objectives; ensuring adequate resources for public health and health prevention activities; and considering urban development options including decentralization.

(iv) Encourage the use of distance training to meet expanding educational demand and the large demand for knowledge and training on the environment.

(v) Promote and strengthen the role of women in the creation and implementation of sustainable development initiatives.

(vi) Seek to improve the quality of education and training and human resource development by upgrading basic education and technical/vocational skills training, and by making improvements where necessary to national management and planning capacities, and labour market linkages.

(vii) Encourage the use of traditional knowledge and skills in environment, resource management and health, and the use of community groups to assist in promoting environmental awareness.

B. Regional action

(i) Support national efforts to develop appropriate curricula for sustainable development at all levels, including the introduction, development and/or access to interdisciplinary training in environmental sciences at a tertiary level, and improve coordination of training activities on sustainable development and environmental issues that are being conducted throughout small island developing States by different organizations, including non-governmental organizations.

(ii) Assess the impacts of urbanization on the physical and human environments and provide health evaluation and impact assessment capability for small island developing States.

(iii) Enhance regional cooperation in education and human resource development and improve the responsiveness of education centres to regional requirements.

C. International action

(i) Support efforts to develop curricula for sustainable development, in particular tertiary level courses on environmental management and sustainable development, encouraging multidisciplinary approaches.

(ii) Provide appropriate resources to meet the particular population concerns of small island developing States, including implementation of any relevant outcomes of the International Conference on Population and Development.

(iii) Improve coordination and targeting of education and human resource development programmes provided by the development partners of small island developing States.

(iv) Support national and regional efforts to improve education and human resource development in small island developing States.

(v) Encourage and support technical cooperation among small island developing States and other developing countries as a means of enhancing sustainable development.

(vi) Support efforts to promote and strengthen the role of small island developing States in the creation and implementation of sustainable development initiatives.

(vii) Support basic regional and national formal and informal health training institutions and research on technology and health problems of small island developing States, paying more attention to malaria, nutrition, drugs, acquired immune deficiency syndrome (AIDS) and maternal and infant health care, and support national and regional efforts to improve urban/rural settlements.

XV. IMPLEMENTATION, MONITORING AND REVIEW

63. Effective implementation, monitoring and review of this action programme is essential for the sustainable development of small island developing States. The action programme is an opportunity for the international community to demonstrate its commitment to the means of implementation agreed upon under Agenda 21. In line with Principle 6 of the Rio Declaration on Environment and Development, the United Nations system and the international community shall give special priority to the needs of small island developing States since they are among the most environmentally vulnerable. This will require, in particular, adequate resources for implementation and actions at the national, regional and international levels.

A. National implementation

64. Small island developing States have begun to implement Agenda 21. In many cases, national strategies have been or are being developed as a basis for action. Further progress is required to ensure that environmental considerations are given appropriate significance at central levels of decision-making and that there is full integration of environmental and developmental considerations at both micro and macro levels. Considerable emphasis has been placed on building endogenous capacity throughout the framework action programme, which will require considerable effort to implement.

65. New participatory approaches to policy-making and implementation of sustainable development programmes will be necessary at all levels. There is a special role for groups which include women, youth, senior, indigenous and local communities as well as the private sector, labour and non-governmental organizations, as articulated in chapter 27 of Agenda 21.

B. Regional implementation

66. As has been highlighted within the action programme, pooling the limited human resources of small island developing States through regional cooperation and institutions is a necessary part of their progress towards sustainable development. Regional action based on priorities, identified in the national strategies and plans of many small island developing States, requires better coordination of effort, stronger regional organizations and improved access to financial and technical resources.

C. International implementation

67. This programme of action is part of the process of the implementation of Agenda 21, in particular, chapter 17 G.

1. Finance

68. The implementation of this programme of action will require the provision of financial resources which are adequate, predictable, new and additional in

accordance with chapter 33 of Agenda 21. This can be achieved by the international community through a number of mechanisms that would:

(a) Provide to small island developing States concessional financial and technical assistance at the levels, in real terms, necessary to support their sustainable development;

(b) Maximize the access of small island developing States to concessional financial and technical assistance taking into account, inter alia, the specific development needs as outlined in the programme of action for the sustainable development of small island developing States and the problems facing these States;

(c) Review, and revise as appropriate, the mechanisms, criteria and procedures used in allocating and providing concessional resources to small island developing States within multilateral and bilateral programmes to improve their effectiveness taking into account the special needs, the sustainable development potential and the prospects for increased small island developing States' contributions to global sustainability through increased resources;

(d) Ensure that financial and technical assistance conforms to the national and, where appropriate, regional priorities of small island developing States;

(e) Provide support to small island developing States to enable them to achieve economic growth and sustainability.

2. Trade

69. The economies of small island developing States are extremely dependent on international trade and very often on international trade in, and market access for, a single commodity. The need for a supportive international economic and trading climate conducive to sustained economic growth and development is therefore critical. Trade liberalization, with a view to enhancing the access to markets for the exports of small island developing States is particularly important.

70. The international community should also aim at finding ways and means of achieving a better functioning and enhancing the transparency of international commodity markets; of providing greater diversification of the commodity sector in small island developing States within a macroeconomic framework that takes into account a country's economic structure, resource endowments and market opportunities; and of providing better management of national resources that takes into consideration the necessity of sustainable development. In this connection, the fulfilment of measures designed under paragraph 2.16 of Agenda 21 are relevant to the sustainable development of small island developing States.

71. In this context, a study should be undertaken on the effects of trade liberalization and globalization on the sustainable development of small island developing States and should include recommendations for ameliorating the negative impacts.

3. Transfer of environmentally sound technologies for cooperation and capacity-building

72. The transfer of environmentally sound technologies, cooperation and capacity-building is a crucial process for achieving sustainable development in small island developing States. In particular, the promotion of access to environmentally sound technologies is a key requirement for enhancing the endogenous capacity of small island developing States.

73. In the context of small island developing States, there is a particular need to focus on the dissemination of information regarding available technology; improving the endogenous capacity of small island developing States to absorb, manage and utilize environmentally sound technologies through, inter alia, education and training; and promoting, facilitating and financing access to and the transfer of environmentally sound technologies, including state-of-the-art technology, as well as corresponding know-how on concessional and preferential terms.

74. The fulfilment by the developed countries and the international organizations of measures described in paragraph 34.18 of Agenda 21 is also of critical importance to small island developing States.

(a) Information

75. The establishment of collaborative networks of subregional and regional research and information systems, in particular mechanisms to facilitate access by small island developing States to information should be supported.

76. Information on environmental emergencies that may result from poor or inappropriate application of technologies and early warning information aimed at preventing natural and environmental disasters should be disseminated.

77. The focal point for small island developing States within the secretariat of the Commission on Sustainable Development could, in coordination with relevant United Nations agencies, including regional scientific and technical bodies, serve as a central data bank for information exchange on available technologies, modalities for their acquisition, and technical cooperation programmes relating to the special needs of small island developing States.

(b) Capacity-building

78. The national capacities of small island developing States to assess, manage, absorb and utilize new technologies should be strengthened. In this context, the existing administrative infrastructure would have to be strengthened so as to train personnel at all levels and educate the end-users of these technologies.

79. Small island developing States should cooperate among themselves and with other developing countries that are in a position to do so with a view to developing and improving environmentally sound technologies. The international community should extend its full support to initiatives aimed at promoting

technology cooperation and capacity-building among small island developing States and other developing countries.

(c) Finance

80. Bilateral and multilateral donors should increase their financial support at the national, regional and international levels for activities that are designed to promote and facilitate the transfer of environmentally sound technologies and capacity-building to small island developing States.

4. Environmental legislation and training

81. International environmental law is an increasingly complex subject which requires careful analysis with respect to its applicability to various bodies of national law. Regional and international programmes to enhance the capacity of small island developing States to develop and implement appropriate national environmental legislation are very important. This should include support for training in all aspects of environmental law, including, where applicable, customary law.

5. Institutional arrangements

82. A specific international mechanism will be necessary to direct the substantial resources required to effectively address the specific needs and concerns of small island developing States.

83. The focal point for the Global Conference which has been established within the Department for Policy Coordination and Sustainable Development of the United Nations should be strengthened, with specialized expertise and resources to research and respond to the specialized sustainable development needs of small island developing States, and should be given overall responsibility to monitor United Nations implementation of agreements and commitments emanating from the aforementioned Conference.

84. During each substantive session of the Commission on Sustainable Development, the report of the focal point to the Commission on international follow-up to the recommendations emanating from the Global Conference should address those items of the programme of action that are pertinent to the Commission's current agenda.

85. The relevant programmes being carried out by the United Nations system and the relevant regional and multinational organizations in the regions and individual countries should be recognized, consolidated and expanded or rationalized, as appropriate. Initiatives to promote economies of scale through integration should also be encouraged. Where applicable, the common objectives of members of regional integration arrangements should be taken into account.

86. Focal points for small island developing States should be established within United Nations specialized agencies having expertise and mandates in particular areas of the programme of action.

6. Vulnerability index

87. Small island developing States, together with national, regional and international organizations and research centres, should continue work on the development of vulnerability indices and other indicators that reflect the status of small island developing States and integrate ecological fragility and economic vulnerability.

88. In this respect, the relevant international organizations could utilize their capacity to support the development of the index.

D. Monitoring and review

89. In addition to the direct monitoring and review of results by the development assistance agencies and countries concerned, there will be regular, ongoing monitoring and review at the global level by the Department for Policy Coordination and Sustainable Development of the United Nations. Within the Department, a unit within the focal point, with a monitoring and review capacity, should be established to gather financial and programmable information on activities supporting the sustainable development of small island developing States. This unit will monitor and review the implementation of the outcomes of the Global Conference and of Agenda 21.

90. A second Global Conference within five years, convened in accordance with chapter 17 G of Agenda 21, will undertake a comprehensive review of the degree of success in enhancing the sustainable development of small island developing States, with recommendations, where necessary, for amending the programme of action and providing means of implementing it.

Notes

1/ Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992, vol. I, Resolutions Adopted by the Conference (United Nations publication, Sales No. E.93.I.8), resolution 1, annex II.

2/ Ibid., annex I.

3/ DPI/1307.

4/ United Nations publication, Sales No. E.83.V.5.

5/ UNEP/190/4 (forthcoming United Nations Treaty Series publication).

6/ United Nations, Treaty Series, vol. 1046, No. 15749, p. 120.

7/ See Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships (United Nations, Treaty Series, vol. 1340, No. 22484, p. 263.